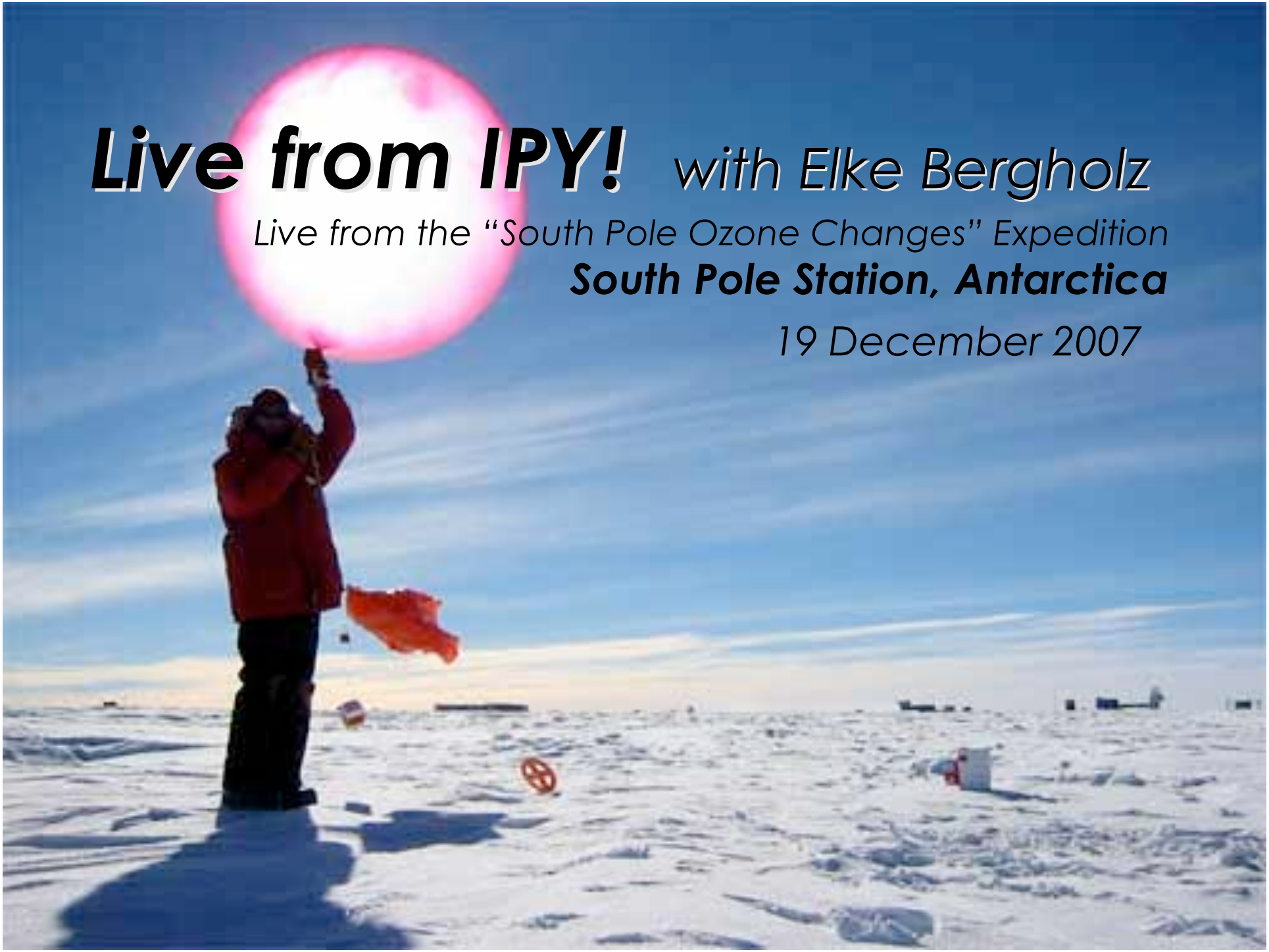
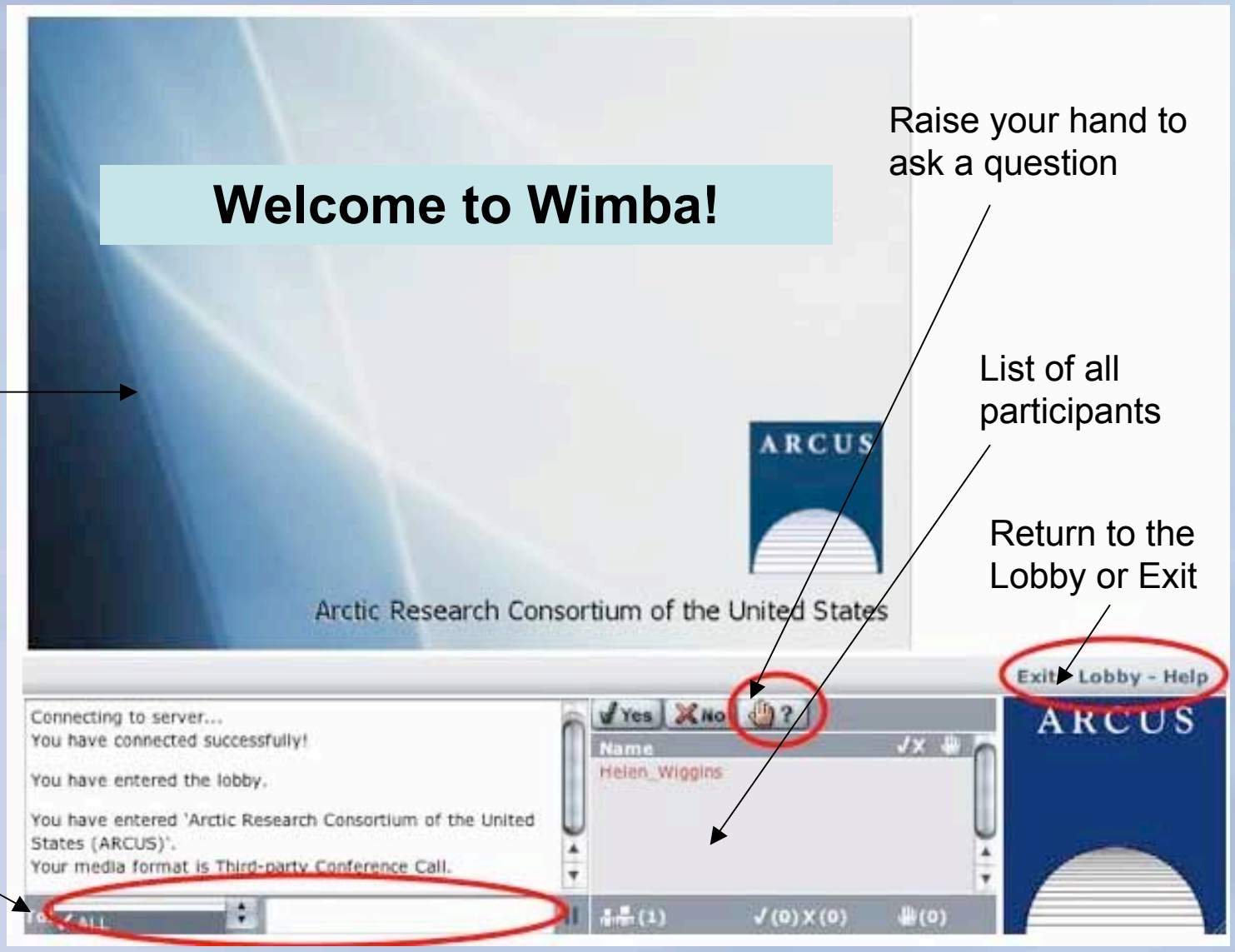

Live from IPY! with Elke Bergholz
Live from the "South Pole Ozone Changes" Expedition
South Pole Station, Antarctica
19 December 2007



Today's event will be recorded and archived at www.polartrec.com.

What is PolarTREC?

PolarTREC is a professional development experience in which K-12 teachers are paired with researchers in authentic polar research experiences.

In the next three years over 40 teachers from around the United States will join scientists in the Arctic and Antarctica in celebration of the International Polar Year!

www.polartrec.com

The PolarTREC Team

Wendy Warnick
PolarTREC PI
Executive Director

Helen Wiggins
Program Coordinator

Janet Warburton
PolarTREC
Project Manager

Katie Breen
PolarTREC
Project Manager

Kristin Fischer
PolarTREC
Project Manager

Ronnie Owens
Web Developer

Ben Wade
Web Developer

Tina Buxbaum
Electronic Media
Project Manager

Zeb Polly
Systems Administrator

Joed Polly
Video Production

…with help from the entire staff at ARCUS

International Polar Year (IPY) 2007-2009

The International Polar Year (2007-2009) is an exciting scientific campaign focusing on the world's polar regions!

IPY is a time for discovery, science, learning, and awareness about the polar regions with activities for youth, scientists, and the public.

www.ipy.org

Who are we talking with today?

Teacher

Elke Bergholz
United Nations International School
New York, NY

Amy Cox
NOAA Officer

Researcher

Andy Clark
NOAA Science Technician

Researcher

Bryan Johnson
NOAA Researcher

Elke Bergholz

PolarTREC Teacher

United Nations
International School
New York, NY

- Marine Biologist, and Environmentalist, MS from University Rostock, Germany, MEd. Columbia University, N.Y.

- Biology teacher for the past 18 years in New York city, 13 years at the United Nations International School

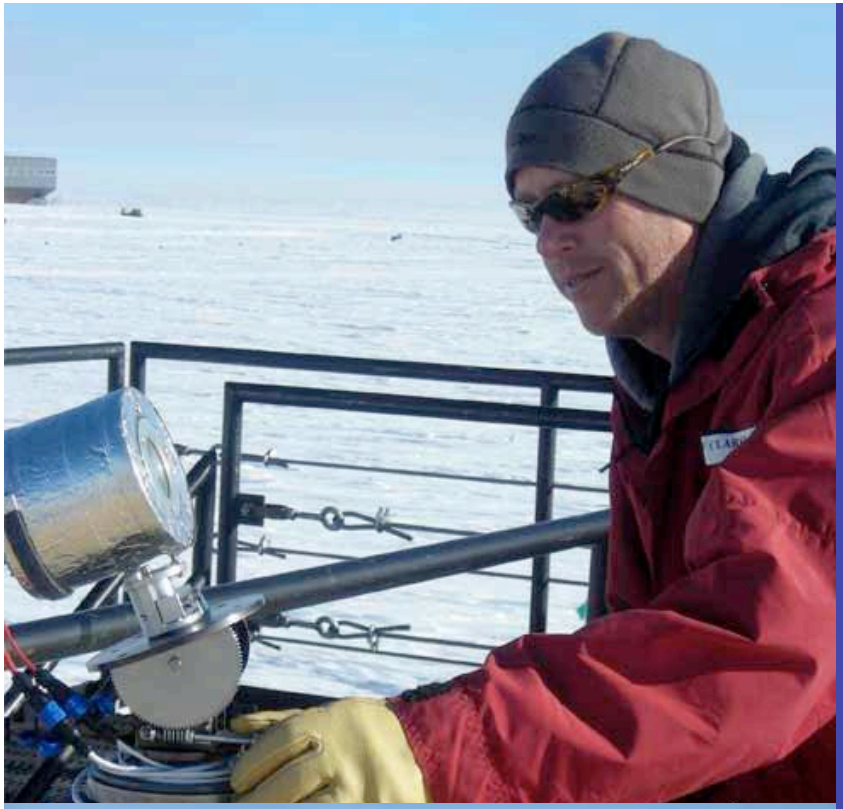
- First time at the South Pole in 1998/99, with TEA

- This is the second time at the South Pole with the same research team and same researcher.

Amy Cox

NOAA Officer

- BS Zoology
- BA Chemistry
- NOAA officer
- With NOAA for 3 years
- Clean Facility station Manager at South Pole Station
- Will over-winter at South Pole this year



Andy Clark

NOAA Researcher

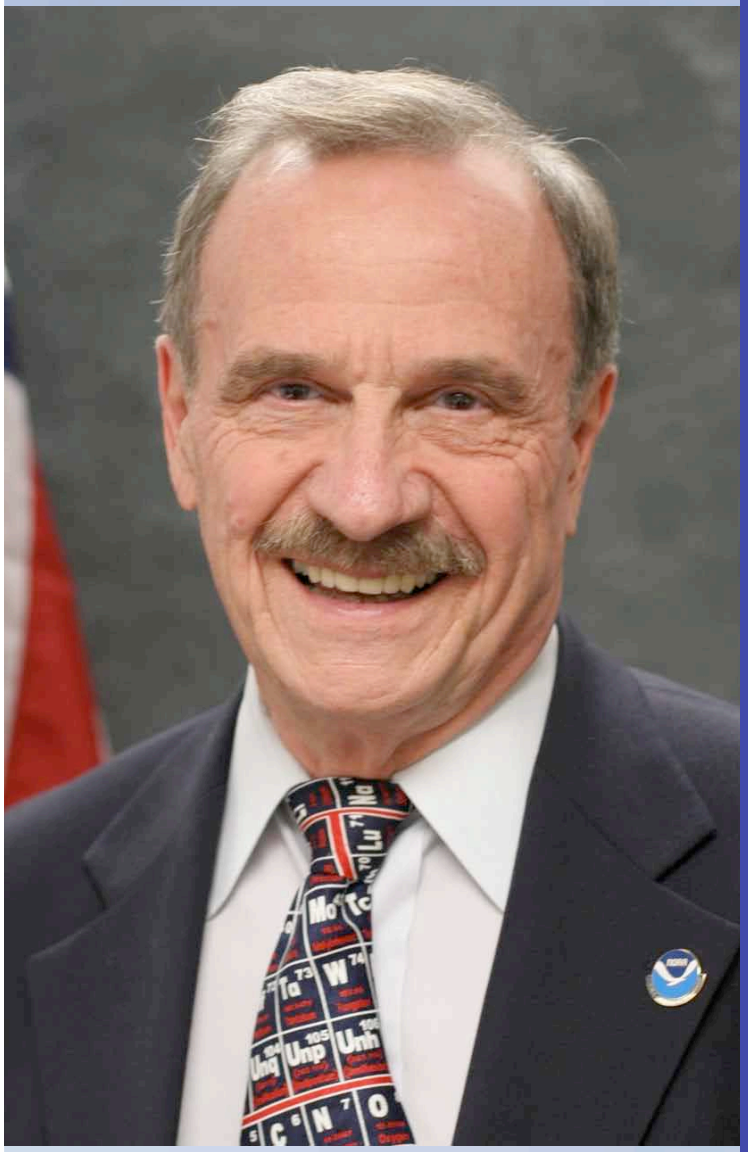
- BA Chemistry, 1993
- NOAA 1993 – 2006, now contracting for field assignments
- 2 times South Pole winter over
- 12 total trips to South Pole since 1999, was part of Elke's team in 1998/99
- Field Camp work in Greenland since 1996
- 6 summer seasons in Greenland mostly at Summit Station
- 3 winter phases (3 month)
- Various travels to other NOAA observatories: Barrow, Alaska, Mounalou. HI, Trinidad, CA, American Samoa

Bryan Johnson

NOAA Researcher

NOAA Environmental System Research Lab Boulder, CO

- PhD in Atmospheric science, undergraduate B.S. in chemical engineering, Masters in meteorology
- Postdoctoral work (ozone hole research) with university of Wyoming
- Started with NOAA in Boulder , Colorado in 1994
- Has been in McMurdo 4 times during postdoctoral
- At South Pole with NOAA the 3rd time



David Hofmann

NOAA Researcher

NOAA Environmental System Research Lab
Boulder, CO

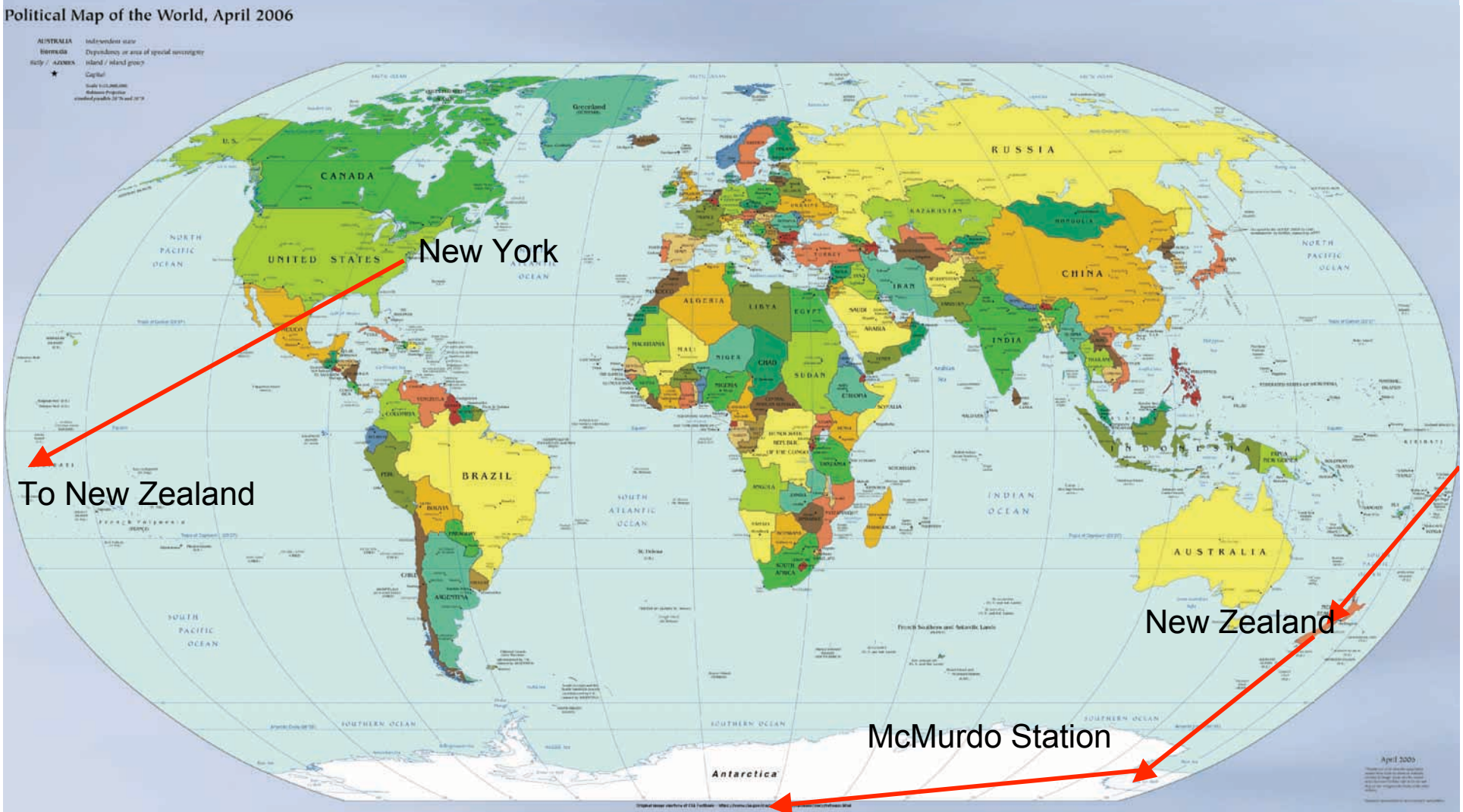
- Director of the Global Monitoring Division of the Earth System Research Lab in Boulder, CO

- Studied the ozone hole with balloons during the National Ozone Expedition (NOZE) to Mc Murdo Station in August 1986

- With NOAA, we have been studying the ozone hole with continuous balloon measurements at the South Pole from 1986-2007

- The primary purpose of the research is to track the recovery of the ozone hole, which will not occur completely for another 60 or more years.

Where is Ms. Bergholz and the Team?




Antarctica
South Pole Station
McMurdo Station
375 mi
USGS

South Pole Ozone Changes Project

Elke and the team is at the NOAA Clean Air Facility at the South Pole Station to collect current data on atmospheric ozone to compare with the data they collected in 1999.

They will attempt to measure the positive influences of the Montreal Protocol on substances that deplete the ozone layer. The group will be collecting information on atmospheric ozone (surface ozone, total ozone, and ozone profiles), carbon dioxide, and aerosols.

Comparisons will be made to other atmospheric data in order to predict the influence that the Kyoto Protocol and other clean air policies might have.

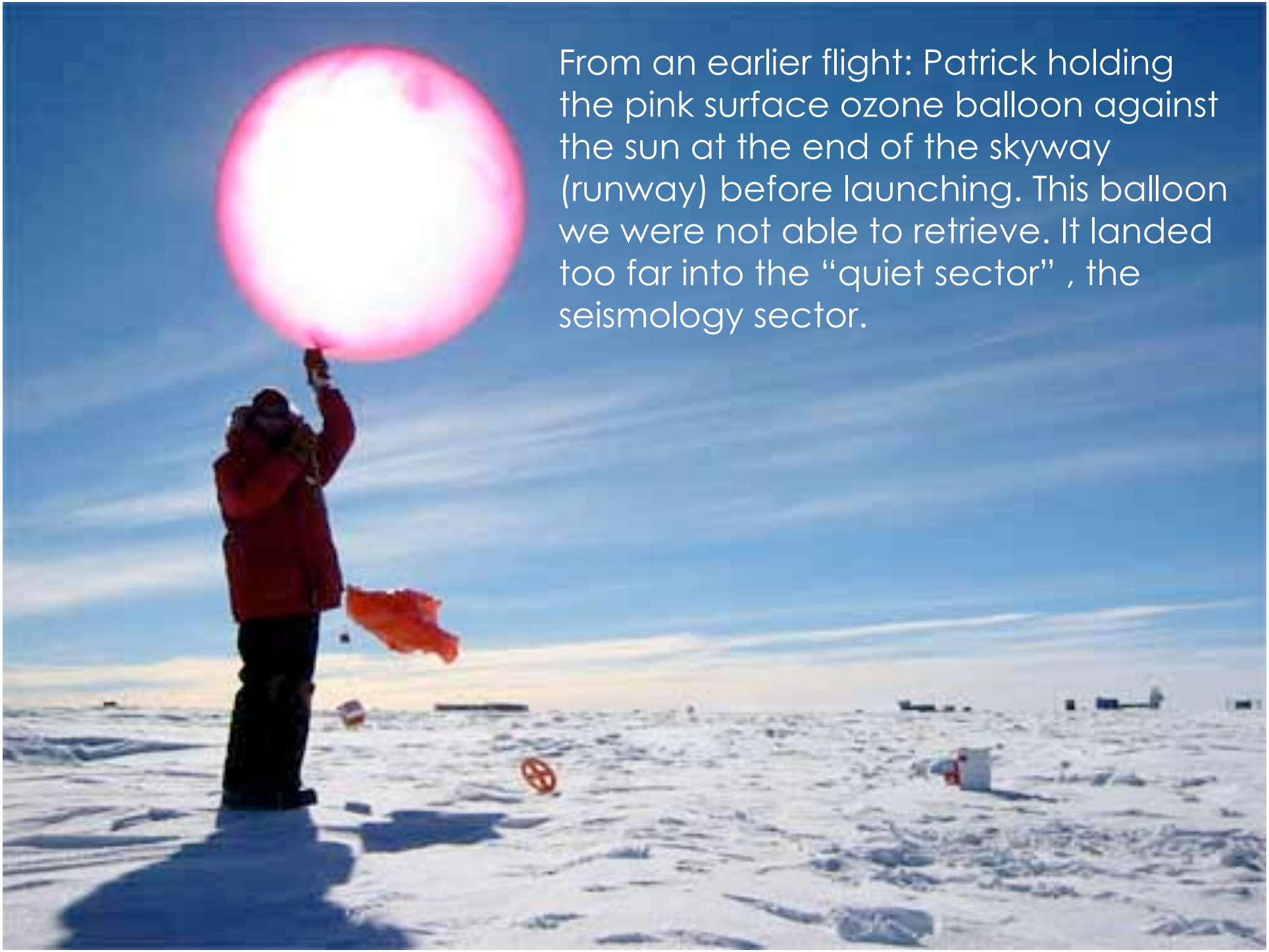
NOAA Monitoring Projects

A) Ozone from the BIF (Balloon Inflation Facility)

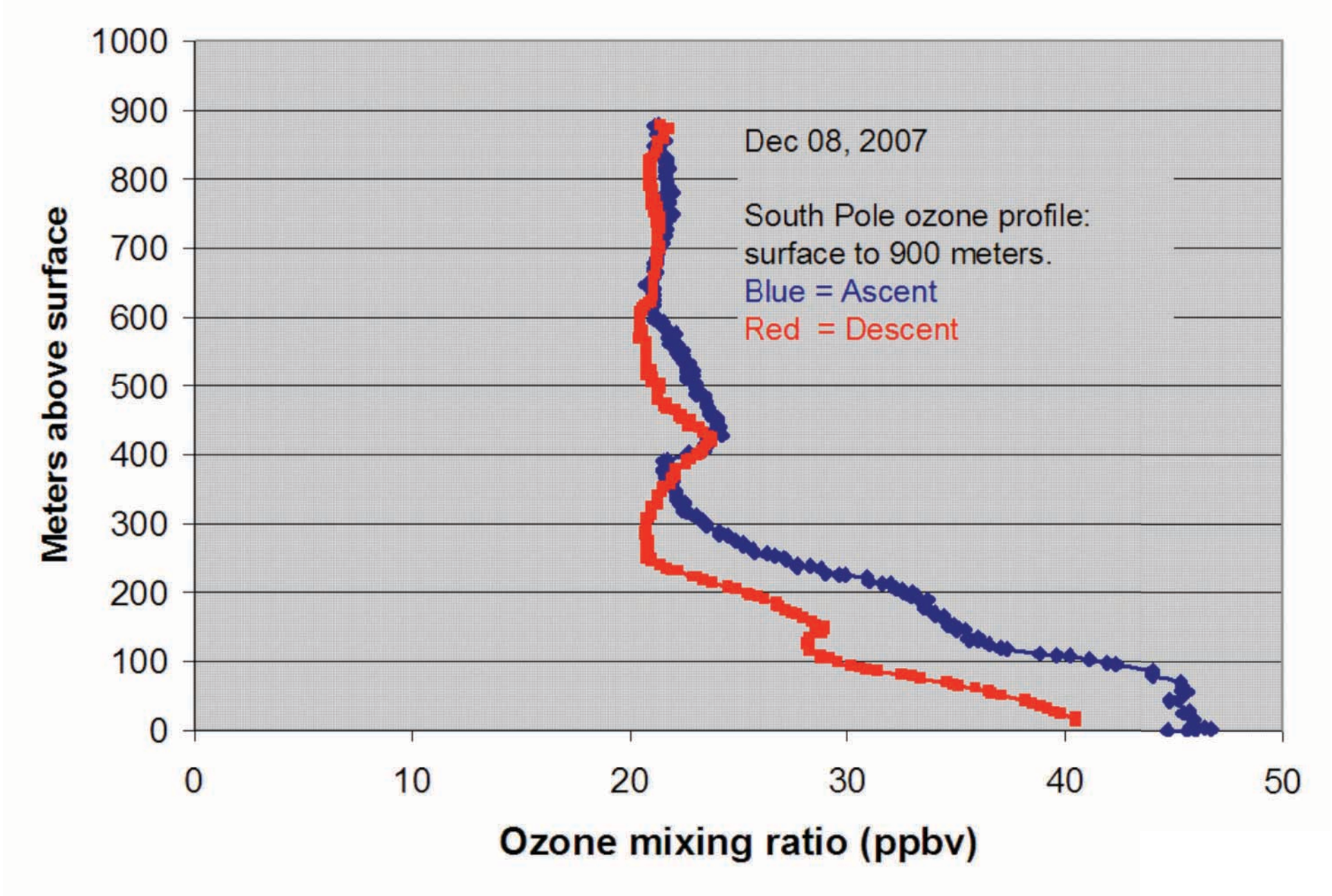
B) Ozone Monitoring from ARO

C) CO2 Monitoring from ARO

D) Monitoring the CFC's in the air with Gas-Chromatograph



From an earlier flight: Patrick holding the pink surface ozone balloon against the sun at the end of the skyway (runway) before launching. This balloon we were not able to retrieve. It landed too far into the "quiet sector" , the seismology sector.



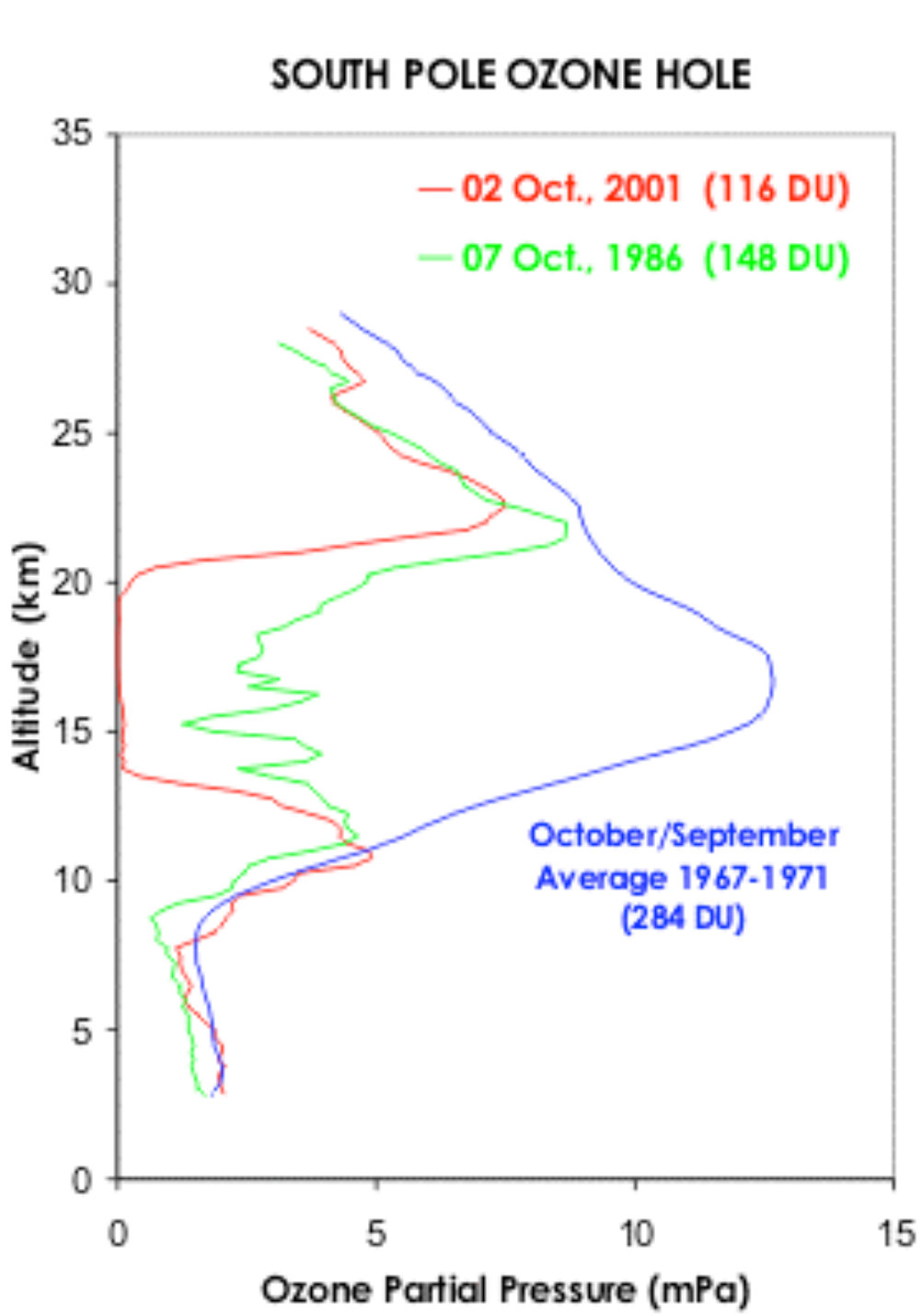
Elevated ozone surface data over South Pole in December.

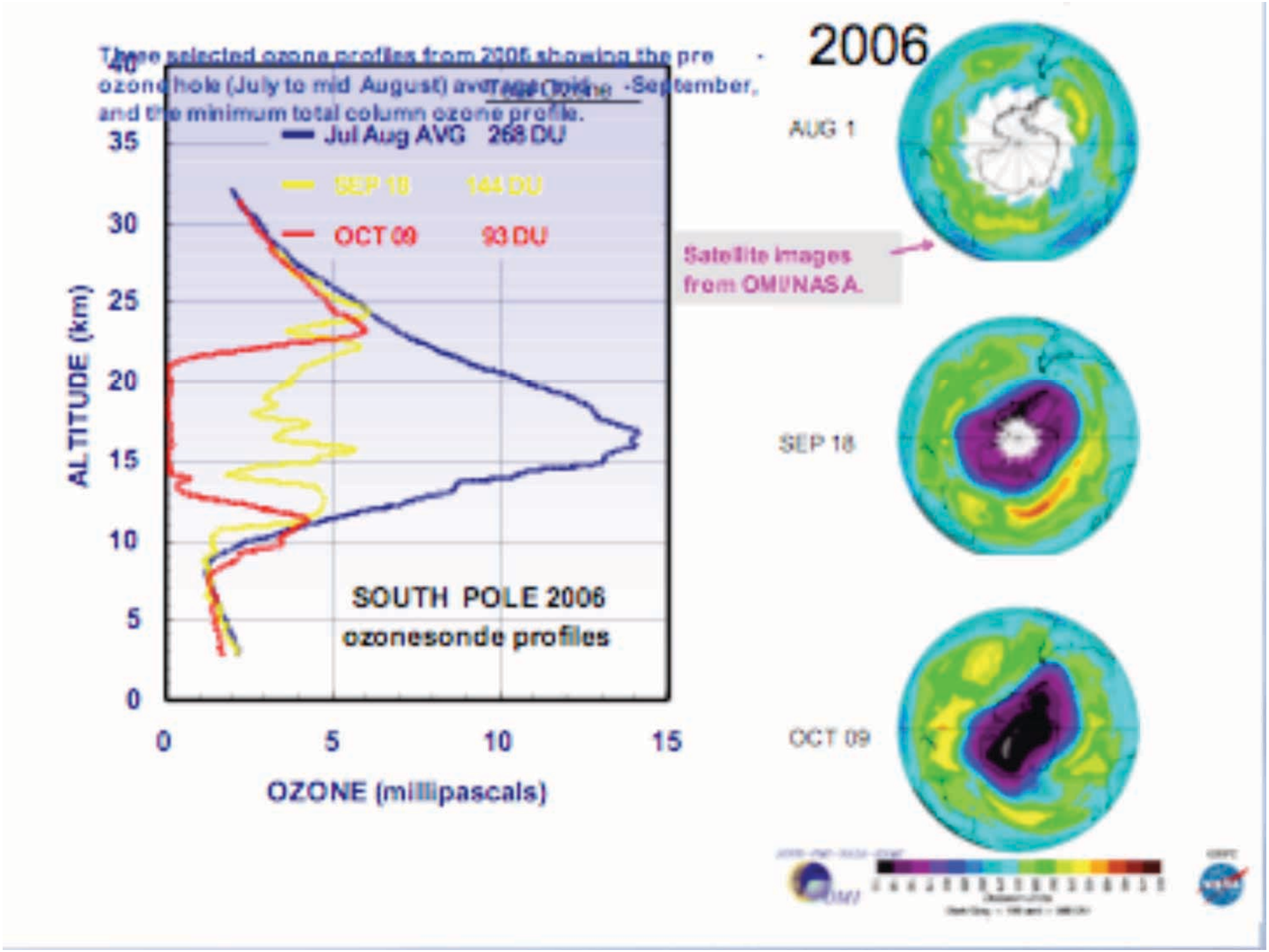
Unrolling the Balloons


The balloon is ready, parachute attached, ready for the ozone sonde
DR3


The sonde has to be outside before launch to read surface ozone correctly

Bryan is launching the stratospheric balloon.


SOUTH POLE OZONE HOLE
02 Oct., 2001 (116 DU)
07 Oct., 1986 (148 DU)
October/September
Average 1967-1971
(284 DU)
Altitude (km)
Ozone Partial Pressure (mPa)
0
5
10
15
20
25
30
35
0
5
10
15


2006
Jul Aug AVG 268 DU
SEP 18 144 DU
OCT 09 93 DU
SOUTH POLE 2006
ozonesonde profiles
ALTITUDE (km)
OZONE (millipascals)
0
5
10
15
20
25
30
35
40
AUG 1
SEP 18
OCT 09
Satellite images
from OMI/NASA.

NOAA Monitoring Projects

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Surface ozone taken by monitor air intake on the roof from ARO meter

This monitor measures the surface ozone as one data point.

Total Ozone taken with the **Dobson** using direct sunlight.

Andy is using the Dobson to measure the total ozone. The ozone is measured with different wave length.

Some wave lengths absorb Ozone , others do not, the difference will be the **total ozone in the atmosphere** at that particular point.

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NOAA
VECO POLAR RESOURCES

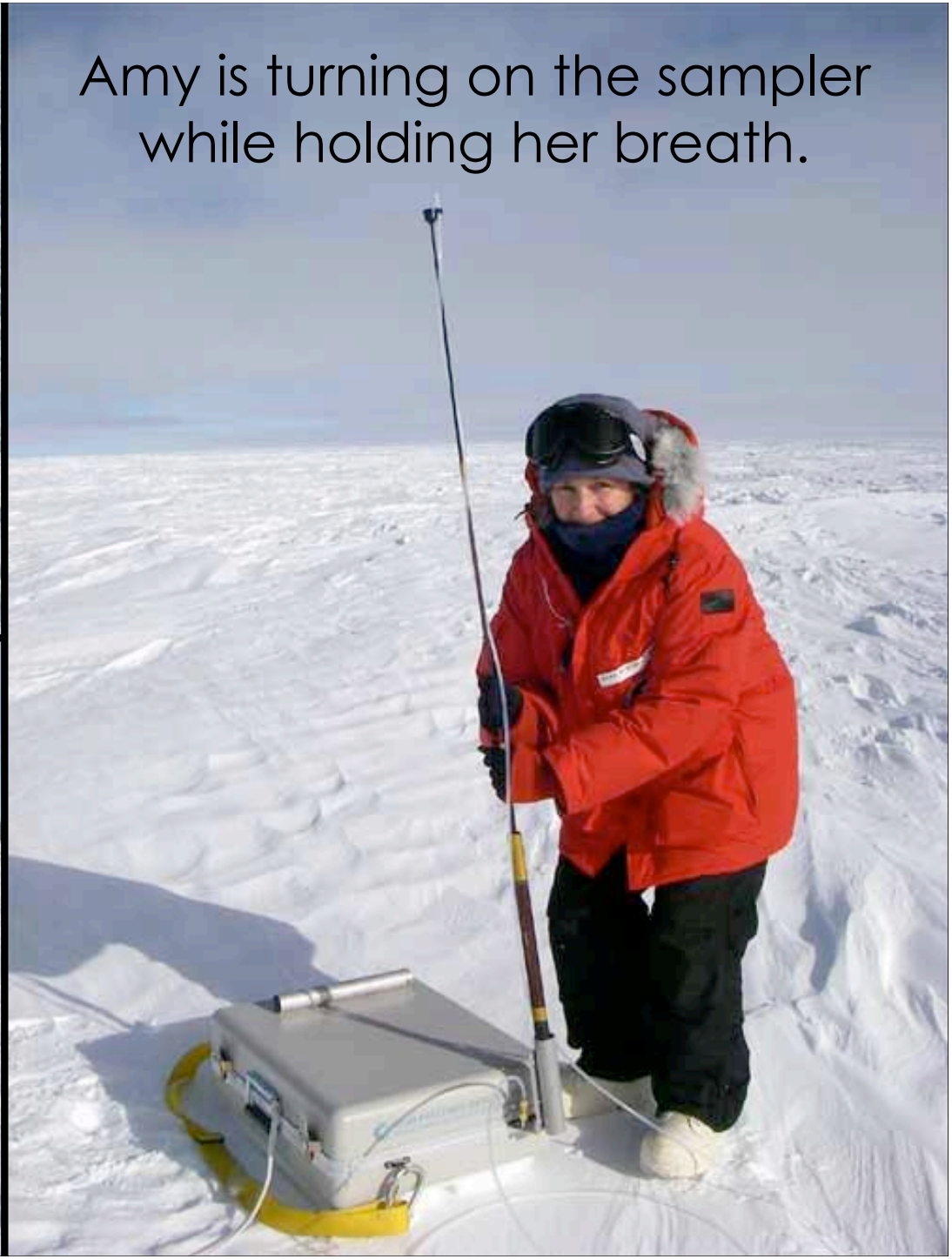

UISHER

The container has a warning sign that it should not be frozen and should not be kept for long on the ice.

Elke securing the CO2Bottles inside the field case. The case will be brought to the Clean Air Area outside of ARO

Amy carries the Field CO2 case down the steps of the ARO Building

Clean Air Area



Amy is turning on the sampler while holding her breath.

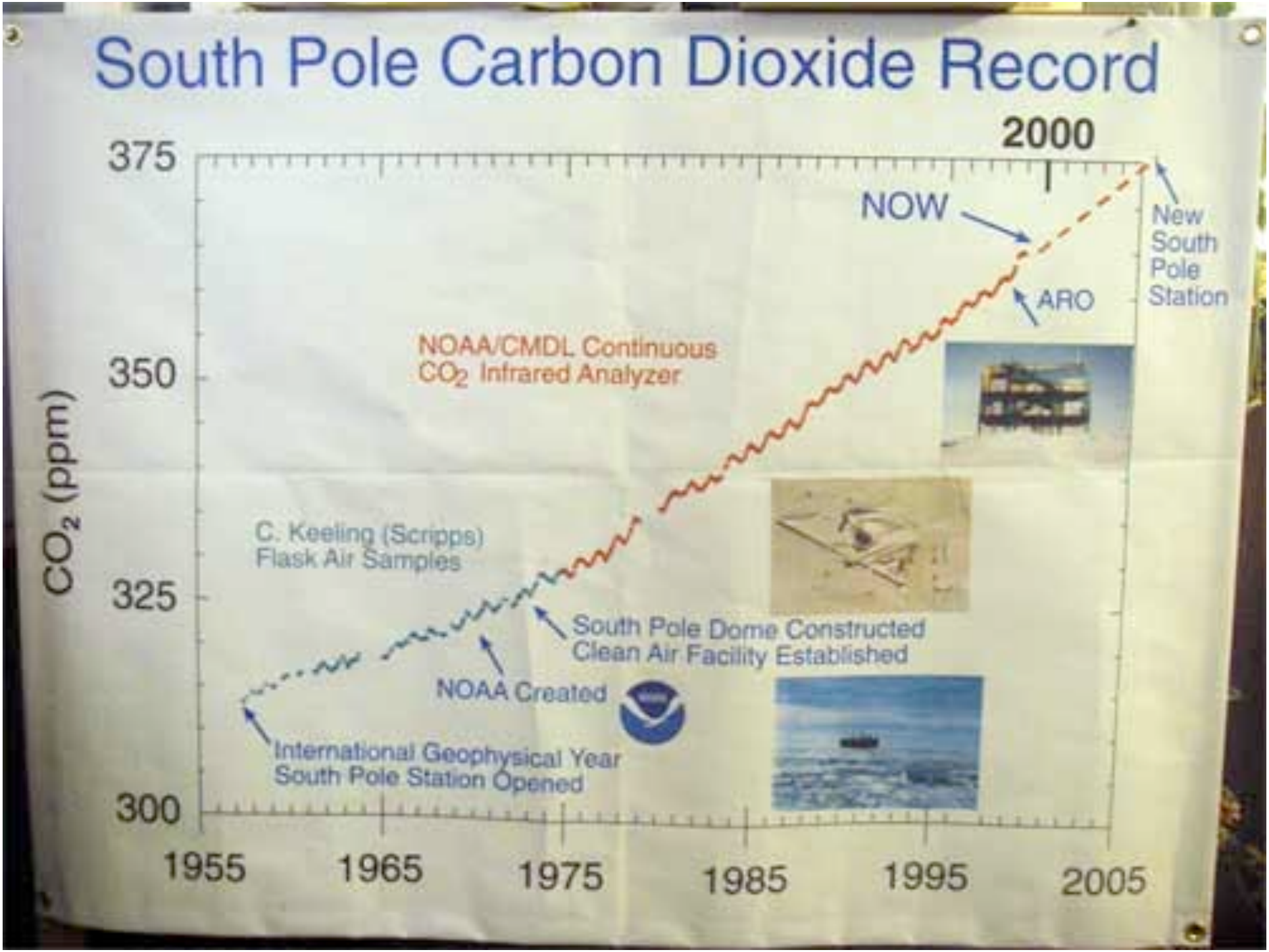
Data needs to be constantly monitored and compiled on the computer.

Andy is working on the computer that collects all the data files.

On the wall is the famous CO2 curve from the different stations of NOAA, including South Pole.

CO2 concentrations are rising everywhere.

South Pole Carbon Dioxide Record



NOAA Monitoring Projects

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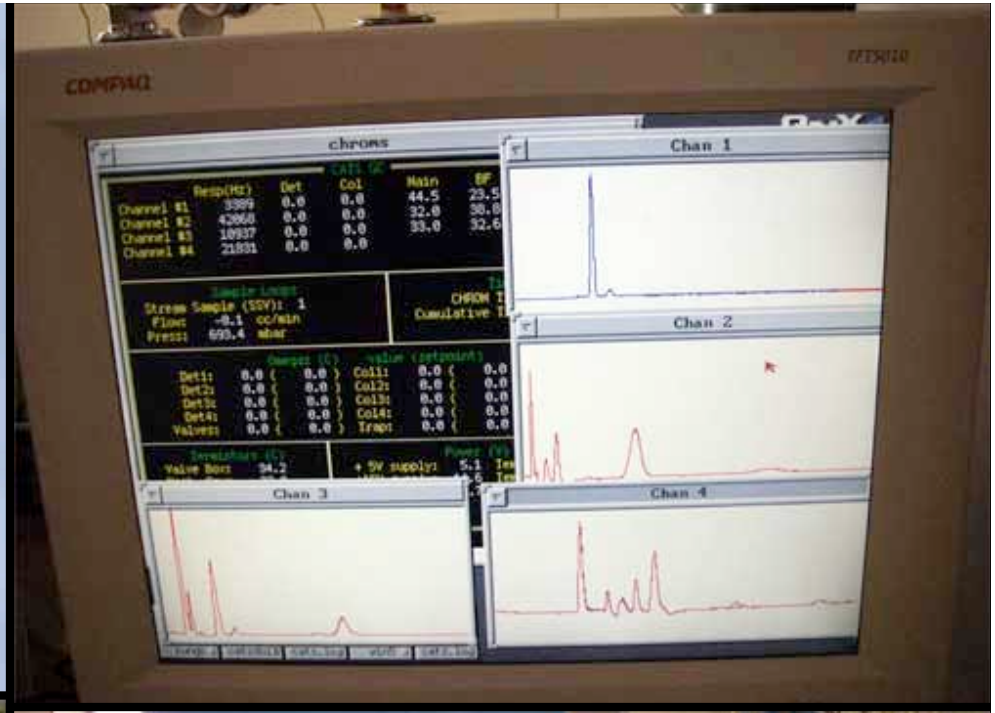
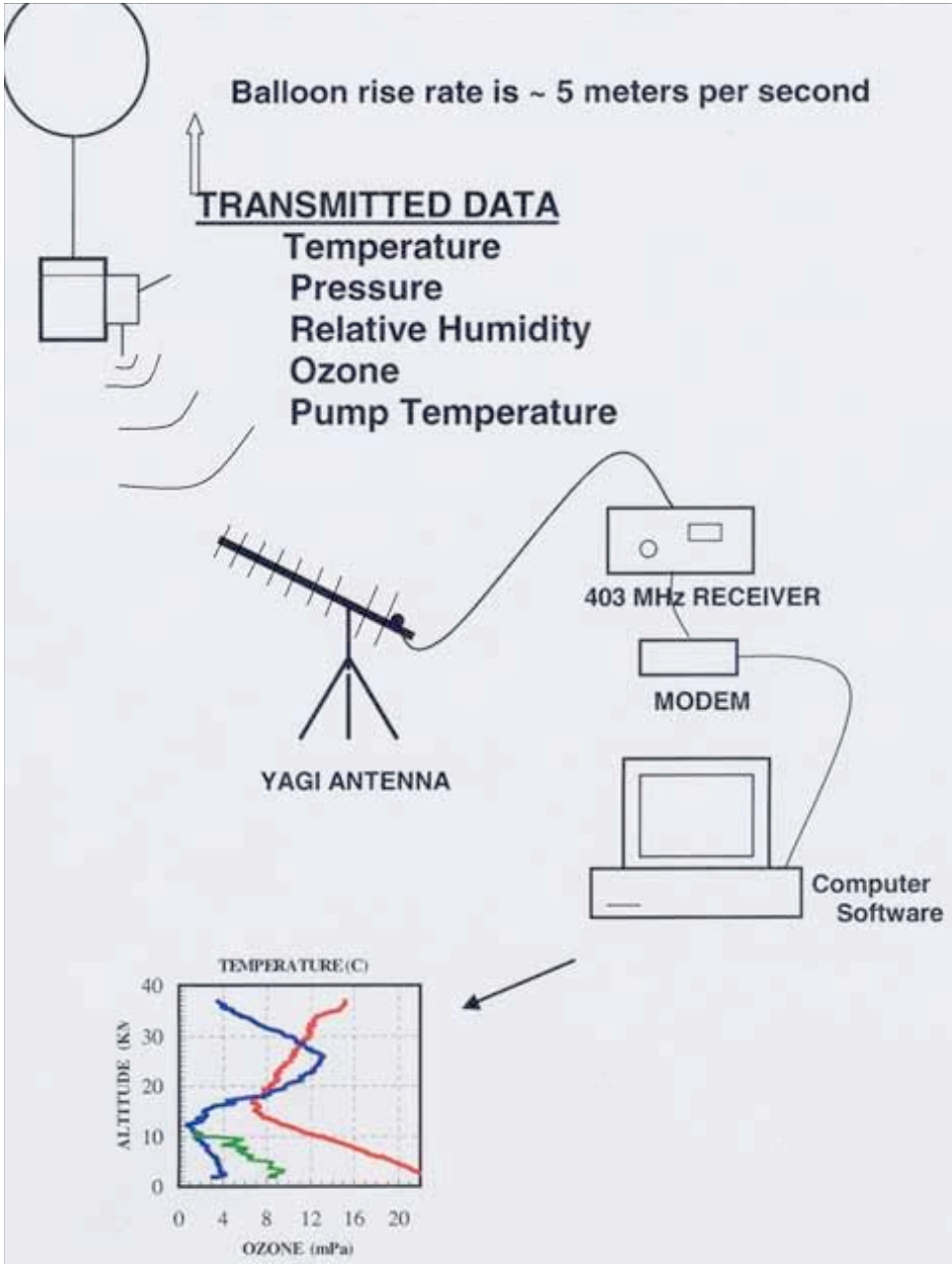
Gas Chromatograph

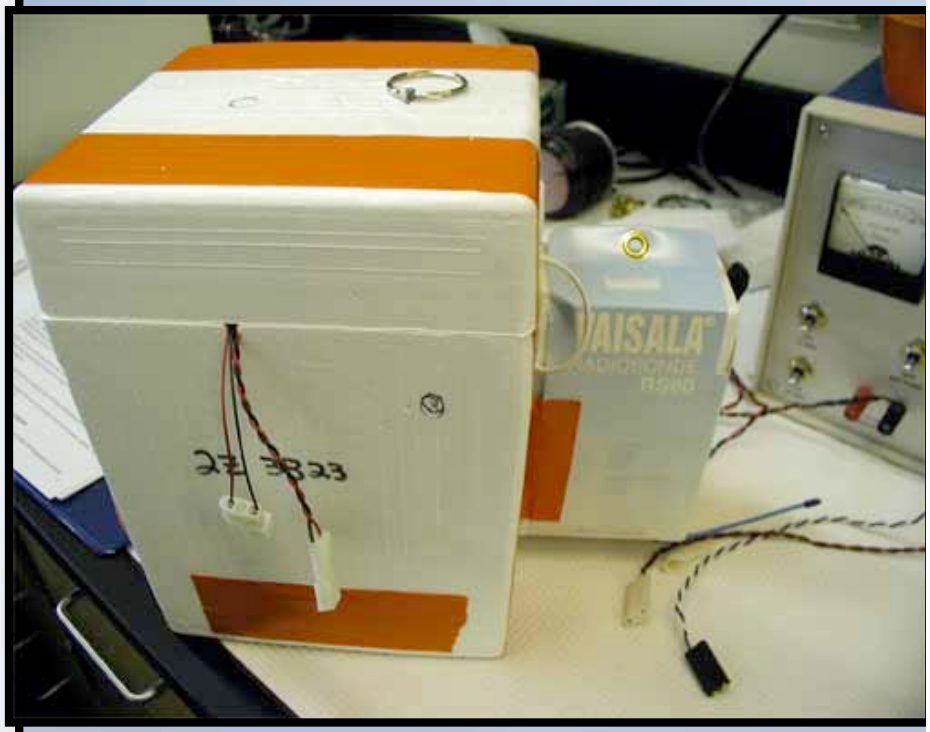


Elke near ARO observing a special HALO display after a very busy day.

New South Pole Station

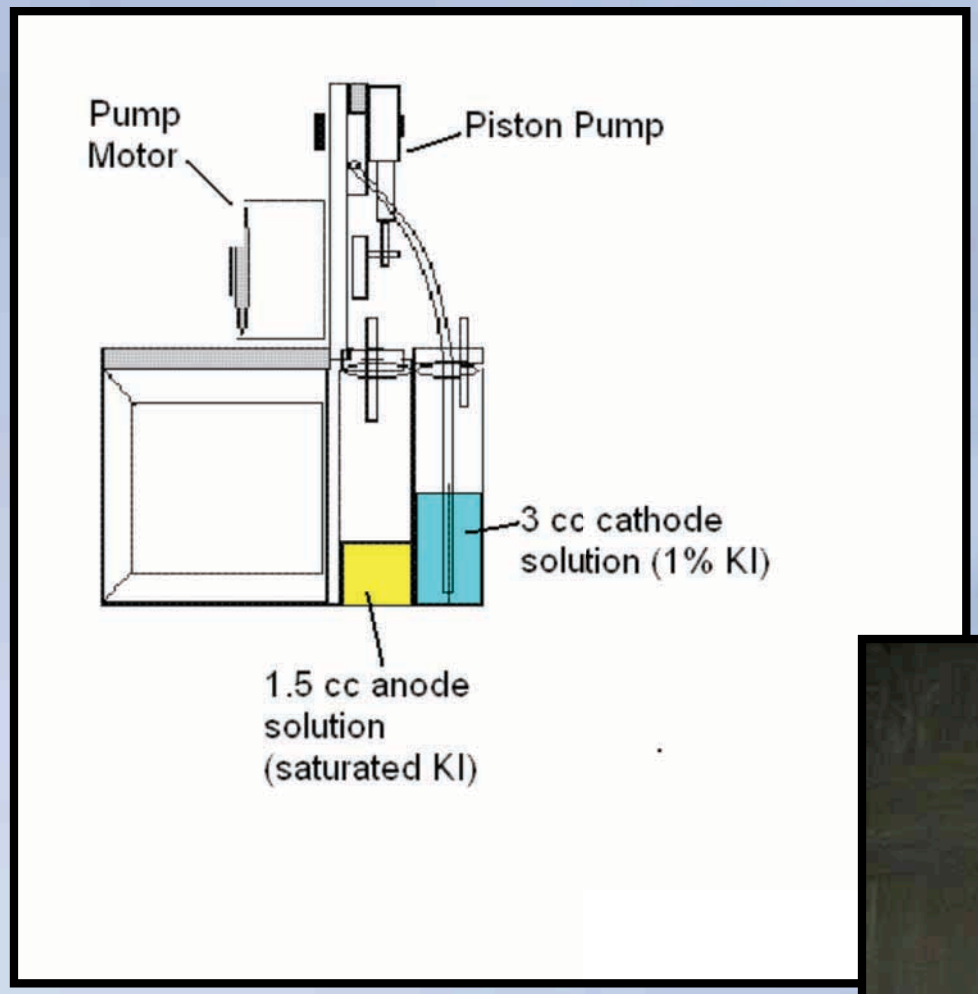
Ozone Sonde Setup

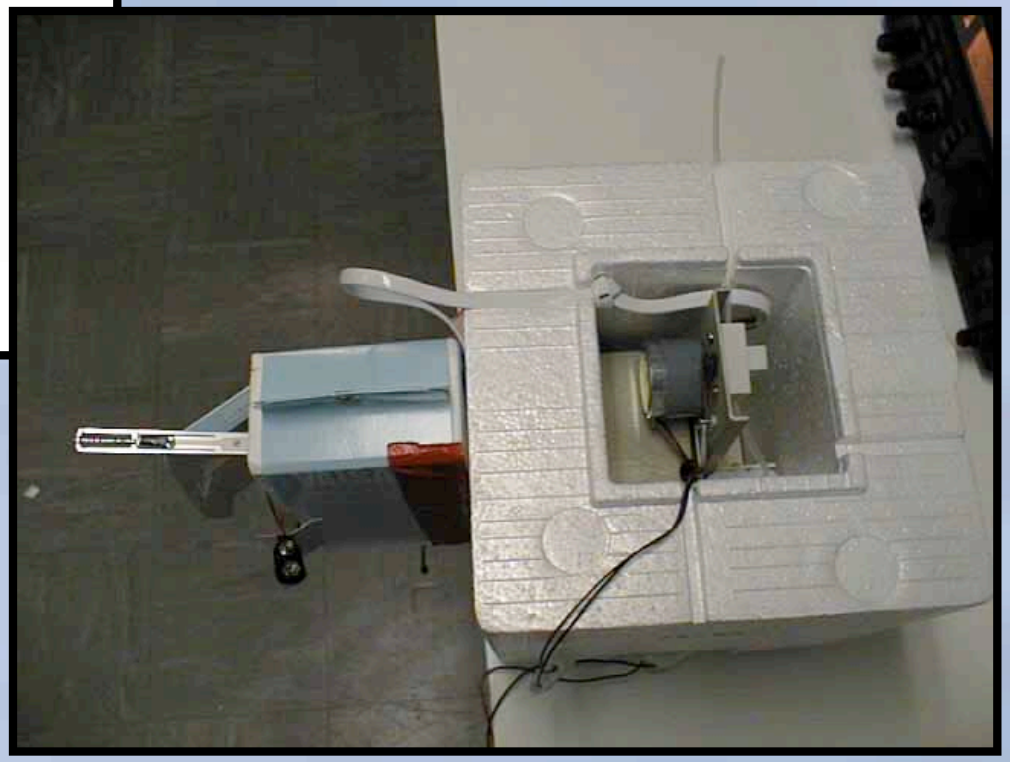




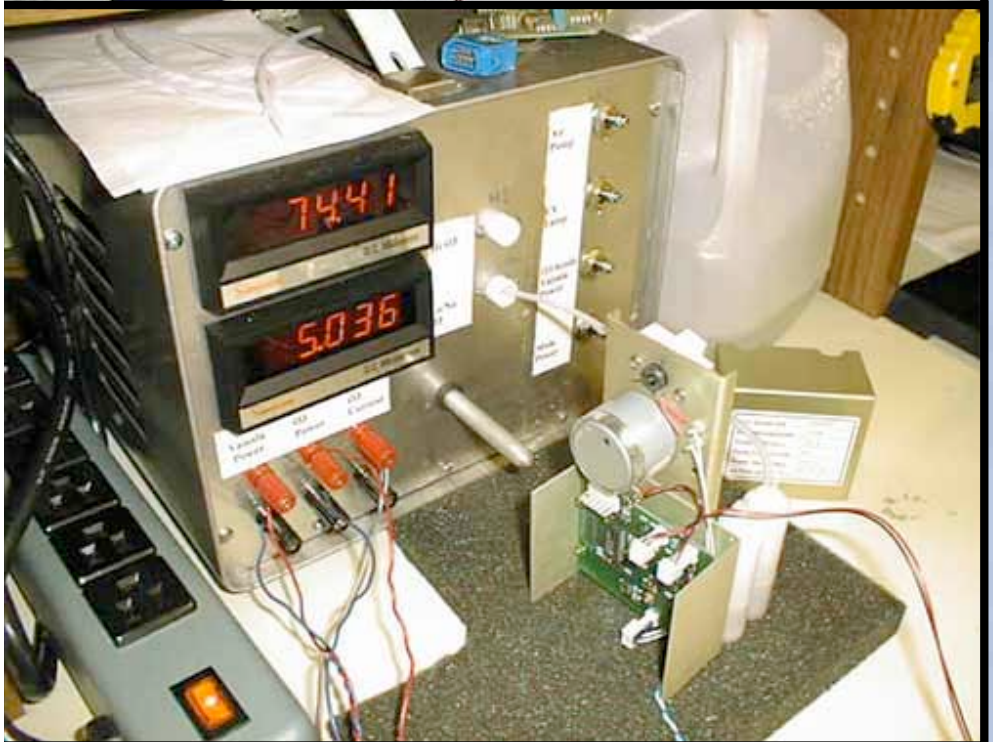
Side view of sonde with radio sonde on the right

Diagram of Sonde





Top view of sonde with ozone sonde inside the white.



Ozone Sonde Test Units

50 YEARS OF
SOUTH
NSF GEOGRAPHIC


Questions?

Check out and register for upcoming events!

Watch for events at: www.polartrec.com.

Thank You!

If you have further questions, please contact us at info@polartrec.com or call 1-907-474-1600

INTERNATIONAL POLAR YEAR 2007-2008

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